

## **Claims listing**

Claims 1-76 (Canceled).

77. (Previously Presented) A system comprising:

an in vivo sensor device comprising a plurality of structural elements defining the in-vivo sensor device, the plurality of structural elements including a first region being composed of a first material, the first material having a first transition temperature and a first transition coefficient to expand from a first diametric state to a second diametric state, the plurality of structural elements including a second region being composed of a second material, the second material having a second transition temperature and a second transition coefficient higher than the first transition temperature and the first transition coefficient, the second region changing from a first position to a second position in the second diametric state upon application of at least one of an internal force and an external force to the in vivo sensor device, wherein the first position is coplanar with the surface of the first region and the second position projects outwardly from the surface of the first region during the second transition temperature; and a detection mechanism configured to detect the second position of the in vivo sensor device, wherein the second material comprises at least one of a shape memory material and a superelastic material.

78. (Previously Presented) The system of claim 77, wherein the first material comprises at least one of a shape memory material, a superelastic material, a plastically deformable material, an elastically deformable material, a stainless steel and a nickel-titanium alloy.

79. (Cancelled)

80. (Previously Presented) The system of claim 77, wherein the second material has a martensite transition temperature that is higher than a martensite transition temperature of the first material.

81. (Previously Presented) The system of claim 77, wherein the second material is configured to respond to at least one physiological condition.

82. (Previously Presented) The system of claim 81, wherein the physiological condition is fluid flow rate.

83. (Previously Presented) The system of claim 81, wherein the physiological condition is temperature.

84. (Previously Presented) The system of claim 81, wherein the physiological condition is plaque.

85. (Previously Presented) The system of claim 81, wherein the physiological condition is an electrochemical change.

86. (New) The system of claim 81, wherein the physiological condition is fluid shear force.

87. (New) The system of claim 81, wherein the physiological condition is molecular binding.

88. (New) The system of claim 81, wherein the physiological condition is cellular binding.

89. (New) The system of claim 77, wherein the in vivo sensor device is one of a temperature sensor, a pressure sensor, a vascular imaging sensor, an endoluminal sensor, and an endothelialization biosensor.

90. (New) The system of claim 77, wherein the second material is configured to respond to at least one exogenous energy stimulus.

91. (New) The system of claim 90, wherein the exogenous energy stimulus is at least one of externally applied temperature, pressure, microwave, ultrasound, RF, ultraviolet, infrared, magnetic resonance, x-rays, beta or gamma irradiation.

92. (New) The system of claim 91, wherein the exogenous energy stimulus is a laser delivered by a laser catheter.